

Name Key

Date \_\_\_\_\_

## Ch 8 Test Review

Fill in the correct conic section based on the definition.

1. Circle The set of all points, in a plane, a given distance from a fixed point.
2. parabola The set of all points in a plane that are the same distance from a given point and a given line.
3. hyperbola The set of all points such that the absolute value of the difference of the distances from a point to two fixed points is a constant.
4. ellipse The set of all points such that the sum of the distances from a point to two fixed points is a constant.

M is the midpoint of  $\overline{RS}$ . Find the missing coordinates.

5. M( $\frac{1}{2}$ , 6) S(3, 7) R(-2, 5)

6. R(8, 5) S(-5, 2) M( $\frac{3}{2}, \frac{7}{2}$ )

$$\frac{1}{2} = \frac{3+x}{2} \quad 6 = \frac{7+y}{2}$$

$$-2 = x \quad 12 = 7+y$$

$$\frac{8-5}{2} \quad \frac{5+2}{2}$$

7. Find the distance between (4, 1) &amp; (1, -3).

$$d = \sqrt{3^2 + (1 - (-3))^2} = \textcircled{5}$$

Write the equation of the parabola in graphing/standard form. Then list the vertex, aos, focus, directrix, and endpoints of latus rectum.

8.  $x = y^2 - 8y + 10$

9.

10.

11.

$$x+6 = (y-4)^2$$

Eq.  $x = (y-4)^2 - 6$

V (-6, 4)

aos  $y = 4$

F ( $-5\frac{3}{4}, 4$ )

D:  $x = -6\frac{1}{4}$

Latus Rectum

( $-5\frac{3}{4}, 4\frac{1}{2}$ ) ( $-5\frac{3}{4}, 3\frac{1}{2}$ )

Eq.  $x = \frac{1}{8}(y-2)^2 + 1$

V (1, 2)

aos  $y = 2$

F (3, 2)

D:  $x = -1$

Latus Rectum

(3, 6) (3, -2)

$$\frac{3+1}{2} = 2$$

$$\frac{1}{4a} = 2$$

$$a = \frac{1}{8}$$

Eq.  $y = \frac{1}{8}(x-4)^2 + 1$

V (4, 1)

aos  $x = 4$

F (4, 3)

D:  $y = -1$

Latus Rectum

(0, 3) (8, 3)

$$\frac{1}{4a} = 2$$

$$a = \frac{1}{8}$$

Eq.  $y = \frac{1}{16}(x-2)^2 - 5$

V (2, -5)

aos  $x = 2$

F (2, -1)

D:  $y = -9$

Latus Rectum

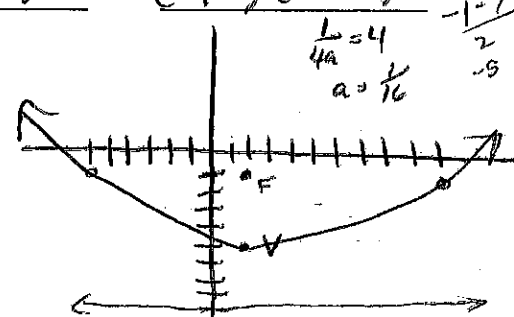
(10, -1) (-6, -1)

$$\frac{1}{4a} = 4$$

$$a = \frac{1}{16}$$

$$\frac{-1-9}{2} = -5$$

Graph #11 on graph paper.



12. Write the equation of a circle with C(-2, 5) and a radius of 3. **Graph on graph paper.**

$$(x+2)^2 + (y-5)^2 = 9$$

13. Write the equation of a circle with diameter endpoints at (-2, 1) and (6, 7).

$$C(2, 4)$$

$$\frac{-2+6}{2} \quad \frac{1+7}{2}$$

$$(x-2)^2 + (y-4)^2 = r^2$$

$$(6-2)^2 + (7-4)^2 = r^2$$

$$16 + 9 = r^2 = 25$$

$$(x-2)^2 + (y-4)^2 = 25$$

14. Write the equation of an ellipse with Foci (2, 0) and (2, 6) and the sum of the focal radii is 8.

$$C(2, 3)$$

$$\downarrow$$

$$2a = 8$$

$$a = 4 \quad c = 3$$

$$16 = a^2 + b^2$$

$$7 = b^2$$

$$\frac{(x-2)^2}{7} + \frac{(y-3)^2}{16} = 1$$

15. Write the equation of a hyperbola with Vertices (-4, 1) and (-4, 9) and Foci  $(-4, 5 \pm \sqrt{97})$ .

$$C(-4, 5)$$

$$a = 4$$

$$c = \sqrt{97}$$

$$\sqrt{97}^2 = 16 + b^2$$

$$81 = b^2$$

$$\frac{(y-5)^2}{16} - \frac{(x+4)^2}{81} = 1$$

16. Write the equation of the ellipse in graphing/standard form, then list the center, a, b, c, the vertices, and the foci.

$$3x^2 + 2y^2 - 24x + 42 = 0$$

$$\text{Eq. } \frac{(x-4)^2}{2} + \frac{y^2}{3} = 1$$

$$a = \sqrt{3} \quad b = \sqrt{2} \quad c = 1$$

$$C(4, 0)$$

$$V(4, \pm\sqrt{3}) \quad F(4, \pm 1)$$

(work on next page)

17. Write the equation of the hyperbola in graphing/standard form, then list the center, a, b, c, the vertices, the foci, and the equations of the asymptotes.

$$9x^2 - 16y^2 - 90x - 64y + 17 = 0$$

$$\text{Eq. } \frac{(x-5)^2}{16} - \frac{(y+2)^2}{9} = 1$$

$$a = 4 \quad b = 3 \quad c = 5$$

$$C(5, -2)$$

$$\text{Asymptotes } y+2 = \frac{4}{3}(x-5) \quad y+2 = -\frac{4}{3}(x-5)$$

$$V(9, -2)(1, -2) \quad F(14, -2)(0, -2)$$

Solve the following systems.

$$x^2 + y^2 - 6y - 16 = 0$$

$$x^2 + y^2 = 16 + 6y$$

$$x^2 + 6y = 16 - y^2$$

$$x^2 + y^2 + 6y - 16 = 0$$

$$-12y = 0$$

$$y = 0$$

$$x^2 = 16$$

$$x = \pm 4$$

$$(\pm 4, 0)$$

Solve each system by graphing.

$$20. \quad x^2 + y^2 \leq 169 \quad C(0, 0) \quad r = 13$$

$$x^2 + 9y^2 \geq 225$$

$$(\text{graph by 2's}) \quad \frac{x^2}{225} + \frac{y^2}{25} \geq 1$$

$$C(0, 0) \quad a = 15$$

$$b = 5$$

On Graph paper

$$19. \quad x^2 + y = 4$$

$$x^2 + y^2 = 10$$

$$y^2 - y = 6$$

$$y^2 - y - 6 = 0$$

$$(y-3)(y+2)$$

$$\begin{pmatrix} \pm 1 & 3 \\ \pm \sqrt{6} & -2 \end{pmatrix}$$

$$21. \quad y \geq (x-2)^2$$

$$(x+1)^2 + (y+1)^2 \leq 16$$

$$V(2, 0)$$

$$C(-1, -1)$$

$$\begin{array}{r} x/4 \\ 1 \overline{) 4} \\ 3 \overline{) 1} \\ 0 \overline{) 1} \end{array}$$

$$r = 4$$

Work

$$(16) \quad 3x^2 - 24x + 2y^2 = -42$$

$$3(x^2 - 8x + 16) + 2y^2 = -42 + 48$$

$$3(x-4)^2 + 2y^2 = 6$$

$$\frac{(x-4)^2}{2} + \frac{y^2}{3} = 1$$

$$(17) \quad 9x^2 - 90x - 16y^2 - 64y = -17$$

$$9(x^2 - 10x + 25) - 16(y^2 + 4y + 4) = -17 + 225 - 64$$

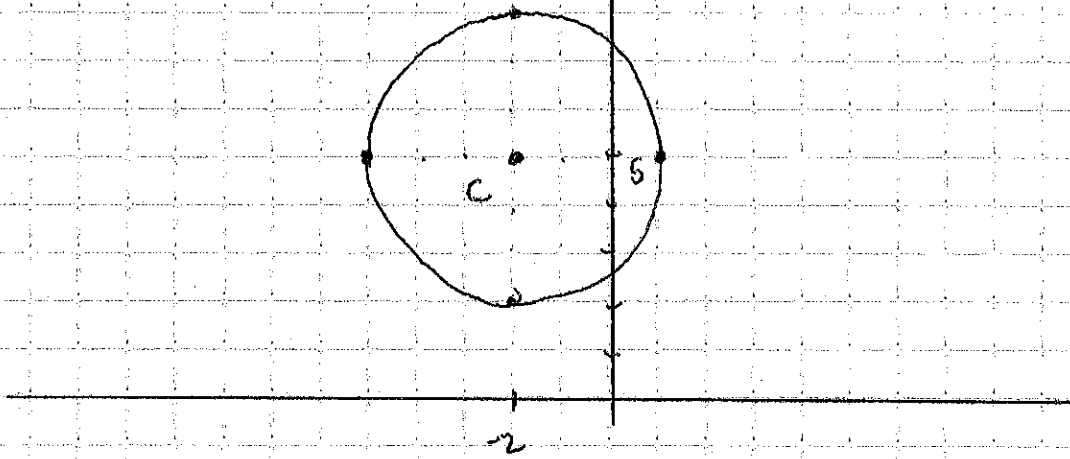
$$9(x-5)^2 - 16(y+2)^2 = 144$$

$$\frac{(x-5)^2}{16} - \frac{(y+2)^2}{9} = 1$$

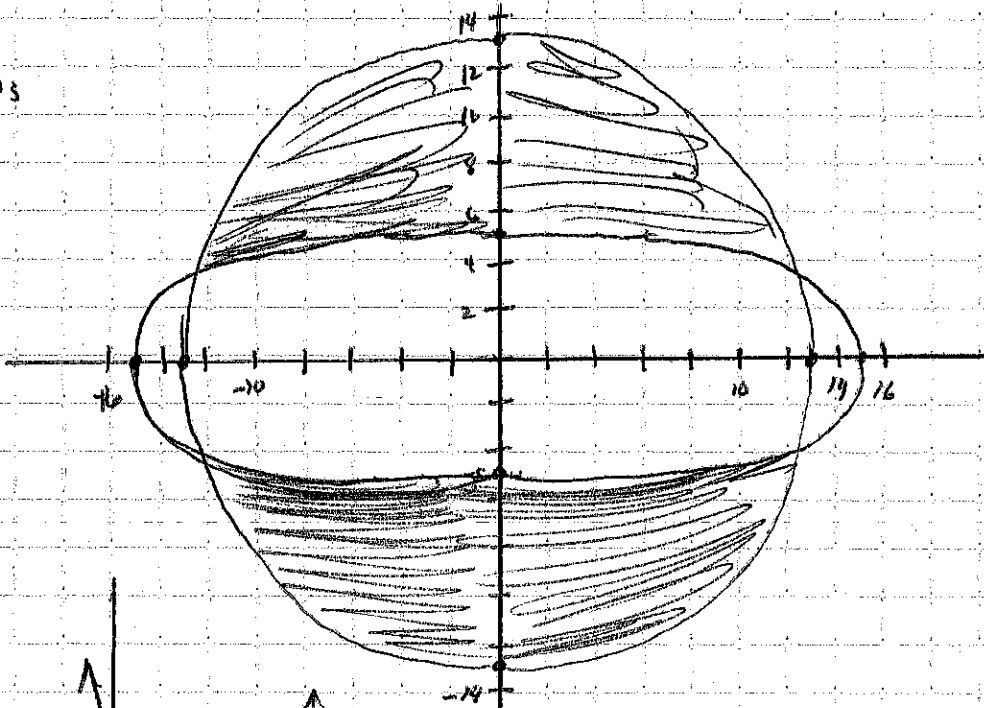
12.

$$C(-2, 5)$$

$$r=3$$



20. By 2's



21.

